

COST and MANAGEMENT

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COST ACCOUNTANTS & INDUSTRIAL ENGINEERS

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R. Dawson, F.F.C.S., F.C.I. (Eng.), Secretary-Manager and Editor
Telephone 2-0700

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• EDITORIAL •

Freezing Prices and Wages

The announcement by Prime Minister MacKenzie King of the intention of the Government to place a ceiling on both prices and wages and to insist that all employees be granted an increased cost of living bonus will be received, we believe, with general approval. Certain it is that in recent weeks prices have soared and keep on soaring with the inevitable result that calls for more and more increased wages have been heard. Such a condition leads but to one end, if allowed to remain unchecked and that end is inflation. No person in his senses wants to see inflation and the government is to be commended for its announced intention to put a stop both to the rise in prices and to the rise in wages. As the Premier said in his recent broadcast, the principle is one easy to explain but much more difficult of attainment and this can only be done with the wholehearted co-operation of everyone. At the time of going to press, it has been impossible to ascertain the re-action, particularly of labor, to these announced proposals but it is, we believe, reasonable to expect that they will find general approval, even though here and there a discordant note is struck. This competition between the rise in the cost of living and wages generally could not be allowed to continue for our war effort is being seriously hampered through such a condition. Not only that, but the danger increases week by week, and if allowed to continue would do much to wreck the stability of the country.

Further, such a scheme, if properly worked, will do much to stabilize conditions immediately following the cessation of hostilities and that certainly is something to aim for. Doubtless there will be mutterings, some even loud, that the Government has no right to interfere with business to such an extent, that wages in some cases are far too low, which may be the case, but in the main there should be general approval of the action of the Government. Doubtless there will be some who will attempt to chisel and it is up to the Government to put real teeth into these proposals and to hand out stiff punishment to those who refuse to accept the inevitable. Unless this is done, the cost of living will continue to rise. Under the new enactment strikes should be a thing of the past, if not, then something is wrong somewhere.

Then, again, this new law should keep down the cost of the war effort and that means something for every wage increase means new taxes and new loans in addition to an increase in the cost of living. Yes, the Government appears to have done quite a good job in this instance. At least it has made a start that way, if it can find a way to do just what it proposes to do.

EDITORIAL

Canada's War Effort

Publication of the result of a recent survey of Canada's War production made by Secretary of War Stimson, of the U.S.A., should do much to put an end to the efforts of many Canadians to decry Canada's War Effort. It shows that at the time the survey was made Canada was ahead of the U.S.A. in production of supplies of all sorts, with the exception of aircraft, and in shells and guns Canada was far in advance of her neighbor. Since that time it has been revealed that the National Steel Car Company, of Hamilton, has recently produced its five millionth shell. The Commonwealth Air Training Plan is far ahead of schedule and Canada's Army is well trained and well equipped. The Navy has performed wonders since the war commenced and, all in all, the situation is far better than many people would have us believe from this point of view.

With all that, however, there seems to be a lamentable lack of something on the part of many Canadians in regard to the war. True we are working hard on production and while great things have been accomplished, one cannot help thinking that more could be accomplished if only we had more real enthusiasm.

The war is too far away, casualty lists have not been heavy, and with the bombing of Britain slowed down tremendously, there is a tendency to sit back in many ways.

Take, for instance, the matter of war savings. There are thousands of people who regard contributions to War Savings merely in the form of a gesture and their subscriptions take that form.

There are others who are contributing right up to the last cent they can afford, but these are few. We have not yet come to the realization that every cent we can possibly put away beyond the bare cost of living is necessary if we are to accomplish what we really ought to accomplish.

When employees, who are earning more than ever before, contribute but twenty-five cents per week to War Savings Certificates and then only because they are afraid not to contribute something, then there is a sad state of affairs, and yet it exists.

Radio shows to advertise the need for War Savings, Posters and Newspaper Advertising will not affect such people; they simply do not care and are using the war to earn more and more in wages and salaries.

They say they cannot spare more, but can they spare their freedom, their democratic form of living and the promise of much better things in the future?

Let George do it seems to be the slogan and some do not seem to care even if George does it or not.

Something is needed to wake us from our lethargy in order that we may give all-out effort that is so badly needed. What that something is, one hesitates to say, but certainly some drastic method will have to be adopted to bring to these people the realization that if the money cannot be obtained in this way it will be obtained in some other.

Across the Secretary's Desk

Now that the season has commenced it is possible to give some estimation as to the probable results. First let me say that despite the fact that most Cost Accountants and others of that ilk, are working harder and longer than for some time past, the opening meetings, with few exceptions, were well attended. This is a happy augury and it is to be hoped that members will endeavor to attend chapter meetings whenever this is at all possible.

In London, there were about eighty-five present. This was a meeting on Unemployment Insurance problems and was very successful. The Hamilton chapter opening meeting attracted fifty-three for dinner and about eighty-five for the meeting. In St. Catharines the attendance at dinner was small but the meeting attendance was about forty-five. I was present at the opening meeting of the London chapter and had quite an experience. That was the day of the big wind storm and I motored from Hamilton dodging trees, telephone poles, fences, etc., all the way up. When I arrived there I found half the city without lights and for a time it was a question as to whether the meeting would be held or not. Cliff England, the popular Vice-Chairman of the London chapter, was to have addressed the Windsor chapter on that same evening but was advised by the London Auto Club not to make the trip by car and the C.N.R. advised him that trains were running very late and that there was a probability that he would not get through. Cliff was obliged therefore to wire cancelling his trip. The Windsor officials were in a quandary for a time but finally succeeded in having Mr. Blackburn, of Hiram Walker, Gooderham & Worts, of Walkerville, talk on "Use and Occupancy Insurance". There were about twenty for the dinner and another fifteen attended the meeting. Toronto and Montreal report good attendances at their opening meetings, while at Kitchener the attendance was good. Edmonton reports an excellent opener and it is anticipated that the opening meeting at Ottawa will show the usual good attendance there.

One thing there is that gives cause for genuine enthusiasm this season and that is the prospects for the Student Sections. These sections this year will take up the systematic study of "Cost Accounting" by W. B. Lawrence. All sections will have, it is hoped, a senior member or members as lecturers and to lead the discussion which will follow each lecture and most of these sections will hold two meetings per month. This study will give all students knowledge of the basic principles of Cost Accounting and should prove invaluable assistance in their regular studies and work as well as a distinct help in preparing them for the examinations next spring.

Frankly I look for a tremendous increase in student membership and feel that on such a foundation the future of our Society is secure. There are undoubtedly many senior members who have on their staffs, young men who could and should join these student sections. The cost is very small and the benefits to be derived are worth many times the cost of student membership.

NEW MEMBERS

One thing in connection with chapter meetings, however, that is very troublesome at the moment is the extreme difficulty experienced in obtaining speakers.

There are undoubtedly a large number of senior members with a wealth of knowledge gained from long experience who could, if they would, do much to help, especially in the smaller chapters and I would appreciate hearing from such men with a promise of help. Already several have promised to help but there is room for many more and this also applies to members who intend to travel west and who could spare an evening to address our western chapters. Why not let me hear from you? Don't always take the attitude that George should do it for we must keep up the interest in all our chapters.

R. D.

New Members

Hamilton Chapter.

Miss Kathleen Hunting, Jones Bros. Co. of Canada Ltd., Dundas, Ont.

J. M. Dingwall, Hydro-Electric System of Hamilton, Hamilton.

C. R. Thomas, Hydro-Electric System of Hamilton, Hamilton.

Kitchener Chapter.

J. C. Buckland, Burroughs Adding Machine Co. of Canada Limited, Kitchener.

Windsor Chapter.

H. Mulheisen, Chrysler Corp. of Canada Ltd., Windsor.

George D. Morgan, Frederick B. Stevens of Canada Ltd., Windsor.

Hamilton Chapter.

D. C. Lehman, Steel Co. of Canada Ltd., Hamilton.

Windsor Chapter.

Murray L. Dowdell, Frederick Stearns & Co. Ltd., Windsor.

The Canada Year Book

We are notified that the Canada Year Book, 1941 Edition, is now off the press and that copies may be obtained from the Dominion Statistician, Bureau of Statistics, Ottawa, at the price of \$1.50 per copy. In this edition is a new feature which gives a detailed account of Canada's War Effort. In addition, the main part of the book extends to twenty-nine chapters dealing with all manner of interesting topics.

Chapter I deals with the natural features of the country, embracing its geography, orography, geology, faunas, lands, scenic and game resources, climate and meterology, etc. History and chronology, and constitution and government are dealt with in Chapters II and III, while the composition of the population, vital statistics, and immigration statistics are to be found in Chapters IV to VI. Chapter VII is a general survey of production and brings together the data from the different fields of Canadian production in such a way as to eliminate the duplication of values as between primary and secondary industries. Chapters VIII to XV, inclusive, give detailed treat-

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ments of production in the leading industries of the country, namely, agriculture, forestry, fur resources and fur production, fisheries, mines and minerals, water powers, manufacturers, and construction. External trade is discussed in Chapter XVI and includes a study of the tourist trade of the Dominion and the balance of international payments. Internal trade as distinguished from external trade is examined in Chapter XVII with special emphasis on the grain trade, the trade in live stock and animal products, the Census of Wholesale and Retail Trading Establishments and commercial failures. Transportation and communications is the subject of Chapter XVIII, which includes a treatment of the relation of the Government to transportation, together with statistics relating to the railways, road transportation, waterways, air transportation and facilities, wire and wireless communications, the post office, and the press. Chapter XIX is concerned with labor, wages and cost of living, and Chapter XX deals with prices of commodities and services with interest rates and import and export valuations. The public finance of Canada—Dominion, provincial, and municipal—is the universally interesting and important subject of Chapter XXI, which also includes a treatment of national wealth and income, and Canadian investments abroad and external investments in Canada. Finance, other than public, is dealt with in the next two chapters: Chapter XXII treats of currency and banking, and miscellaneous commercial finance, including loan and trust companies, bond sales, and foreign exchange; Chapter XXIII of fire, life, and miscellaneous insurance. Chapters XXIV to XXVI deal with education, public health and related institutions, and judicial and penitentiary statistics, respectively, and Chapter XXVII with miscellaneous administration. The sources of official statistical and other information relative to Canada are given in Chapter XXVIII, together with a list of the publications of the Dominion and Provincial Governments. The concluding Chapter XXIX contains information on Dominion legislation of 1940, and principal events of the period, official appointments, etc. The volume is carefully indexed, and includes several lithographed maps and many charts and diagrams.

Chapter Programs

We publish below the complete program of the Montreal Chapter and which is just about the most complete any chapter of the Society has published in recent years. The Montreal Chapter is to be heartily commended not only for the complete program but for the type of program.
October 3rd—Opening Dinner, Windsor Hotel.

Speaker: Mr. H. R. MacMillan, President, War-time Merchant Shipping, Limited.

October 17th—Dinner and Lecture Meeting, Faculty Club.

Ten minute talk on Industrial Legislation.

Lecture No. 1 in "Cost Series."

Subject: "Control of Operating Costs by Budget."

Speaker: Mr. H. M. Hetherington, Viceroy Manufacturing Company, Limited, Toronto, Ont.

CHAPTER PROGRAMS

- October 31st—Dinner and Lecture Meeting, Faculty Club.
Ten minute talk on Industrial Legislation.
Lecture No. 1 in "Management Series."
Subject: "The Chief Financial Officer and Business Management."
Speaker: Mr. H. G. Norman, C.A., Past President, Society of Chartered Accountants of the Prov. of Quebec; Partner, Price Waterhouse & Co., Montreal, Que.
- November 14th—Dinner and Meeting, Faculty Club.
Ten minute talk on Industrial Legislation.
Student Night: Under the direction of D. R. Patton, C.A.
- November 28th—Dinner and Lecture Meeting, Faculty Club.
Ten minute talk on Industrial Legislation.
Lecture No. 2 in "Management Series."
Subject: "The Secretary and Business Management."
Speaker: Mr. L. A. Tucker, C.A., F.C.I.S., Comptroller and Secretary-Treasurer, The St. Lawrence Corporation, Montreal, Que.
- December 12th—Dinner and Lecture Meeting, Faculty Club.
Ten minute talk on Industrial Legislation.
Lecture No. 2 in "Cost Series."
Subject: "War Orders and Overhead Distribution."
Speaker: Mr. Frank E. Wood, Chief Cost Accountant—Treasury—Cost Accounting Section, Department of Munitions and Supply.
- January 16th—Annual Smoker.
Time and place to be announced.
- January 30th—Dinner and Lecture Meeting, Faculty Club.
Ten minute talk on Industrial Legislation.
Lecture No. 3 in "Management Series."
Subject: "The Credit Man and Management."
Speaker: Mr. Charles P. Dumas, L.C.M.I., Manager, The Canadian Credit Men's Trust Assoc. Ltd., Montreal.
- February 13th—Dinner and Lecture Meeting, Faculty Club.
Ten minute talk on Industrial Legislation.
Lecture No. 3 in "Cost Series."
Subject: "An Approach to Some Municipal Cost Problems."
Speaker: To be announced.
- February 27th—Dinner and Lecture Meeting, Faculty Club.
Ten minute talk on Industrial Legislation.
Lecture No. 4 in "Management Series."
Subject: "The Plant Engineer and Management."
Speaker: Mr. J. S. Cameron, Manager, Northern Electric Company, Limited, Montreal.
- March 13th—Dinner and Lecture Meeting, Faculty Club.
Ten minute talk on Industrial Legislation.
Lecture No. 4 in "Cost Series."
Subject: "Some Aspects of Cost Accounting."
Speaker: Mr. George Appleton, Toronto Hydro-Electric System—and President, C.S.C.A. and I.E.
- March 20th—
Plant Visit: To offices of International Business Machines Co. Limited.
Soirée Française: Time and place to be announced.

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April 10th—Dinner and Lecture Meeting, Faculty Club.

Ten minute talk on Industrial Legislation.

Lecture No. 5 in "Management Series."

Subject: "The Sales Manager and Management."

Speaker: Mr. Rene B. Perrault, President and Managing Director, Cumming Perrault, Limited, Montreal.

April 24th—Dinner and Lecture Meeting, Faculty Club.

Ten minute talk on Industrial Legislation.

Lecture No. 5 in "Cost Series."

Subject: "Costs in the Mining Industry."

Speaker: Mr. E. D. Fox, McIntyre Porcupine Mines, Limited, Toronto, Ont.

May 8th—Closing Dinner and Annual Meeting, Faculty Club.

Election of Directors and Officers.

Address: "Clear Thinking in Administration." Comment inspired by the lectures in the management series.

Speaker: Mr. Paul Kellogg, M.E.I.C., L.C.M.I., President, The Cost and Management Institute.

Toronto Chapter.

The next meeting of the Toronto Chapter will be held on Wednesday, November 12th, at Eaton's Round Room, College Street, when the speaker will be Mr. Ray D. Kinsella, Chairman, Rochester Chapter, N.A.C.A., and an executive of the Eastman Kodak Company. His topic will be, "The Use of Standards for Cost Control". This will be a Joint Meeting with Hamilton Chapter members as guests.

Hamilton Chapter.

The next meeting of the Hamilton Chapter is scheduled for Wednesday, October 29th, at the Royal Connaught Hotel. Speaker, Mr. A. J. Mouncey. Subject, "Modern Trends in Cost Accounting". Meetings are held at the Royal Connaught Hotel on the second and last Wednesday in each month. Dinner at 6.45 p.m., meeting at 7.30 p.m. Student Section meetings on each first and third Wednesday at Technical Institute.

Niagara Chapter.

Meetings are held on the third Tuesday in each month at the Leonard Hotel, St. Catharines, unless otherwise specified.

Student Section meetings are held on the second and fourth Wednesday in each month.

Kitchener Chapter.

Meetings are held on the third Wednesday in each month. Meeting place not yet settled. Student Section to meet twice monthly.

London Chapter.

Meetings are held at the Y.M.C.A., London, on the third Thursday in each month.

Student Section meetings not yet settled as to dates.

Windsor Chapter.

Meetings are held on the fourth Thursday in each month at the Norton Palmer Hotel with dinner at 6.30.

Student Section meetings are held at the Norton Palmer Hotel on the first and third Thursday in each month.

Ottawa Chapter.

LITERATURE RECEIVED

Meetings are held on the third Monday in each month at the Laurentian Club. Dinner at 6.30.

Student Section meetings not yet settled as to place and dates.

Personal Notes

Congratulations to Alex L. Clark, Treasurer of our Edmonton Chapter, who is now a Pilot Officer in the R.C.A.F.

Also to Harvey Kelley, of the Hamilton Chapter, who is now a Signaller in the Royal Canadian Navy.

Good luck to both these fellows and a safe return.

It is with extreme regret that we learn, just as we go to press, of the death of Frank A. Landeg, of the Steel Company of Canada Ltd., a former director of the Hamilton Chapter. Frank had been ill for some time but his death comes as a great shock. Members generally will join in extending to his widow and family sincere sympathy.

Literature Received

Effects of the Defense Program on Prices, Wages and Profits.

The Brookings Institution.

A very comprehensive and complete booklet of forty-four pages on a subject of real interest.

Uniform Pricing.

N.A.C.A., September 1.

The Use of Predetermined Cost in Pricing in the Shoe Industry.

N.A.C.A., September 1.

Two articles of great value in connection with the pricing of products in two widely diversified industries.

Flour Milling Costs.

N.A.C.A., October 1.

Accounting in the Cement Industry.

N.A.C.A., October 1.

Two articles which while dealing with industries of somewhat similar types, nevertheless are very dissimilar and should be read not alone by those engaged in these two industries.

Depreciation of Plant in Production Costs.

The Accountant's Journal, August.

A splendid article on a subject which always makes interesting reading for Accountants and Cost Accountants.

Cost Accounting in Industry To-day.

The Australian Accountant, August.

A general article which will more than repay its reading.

Costing, Co-ordination and Overhead

By HAROLD B. WILLIAMSON, A.I.C.A.

Reprinted from *The Australian Accountant*

It has been authoritatively stated by a United States Government Committee, as lately as the period subsequent to the depression, that the probability is that the ratio of Industrial Manufacturing concerns which have gone in for efficient costing is one in ten.

This is a position which requires close examination and may have its foundation in the fact that there is a decided lack in the recognition of the necessity for services of a costing consultant at the inception of the enterprise.

It is the Constructional Engineer who must be the adviser in the designing and lay-out of the machines and departments in the planning of the factory, and it is here that the work of the Costing expert, with his special knowledge as to the requirements of an efficient costing installation, must dovetail and co-ordinate with that of the Engineer, in order to obtain the maximum of efficiency in factory production.

The Engineer is in the position of being able to appreciate this, as his knowledge of costing is more than superficial.

He is also in the position of being able to criticize any system that may be installed, and on occasions has done this to considerable purpose.

How often does that Engineer, who has planned his estimates on some exact basis, find them all at sea because he has had to rely for overhead upon some arbitrary percentage of Direct Labor, and his Direct Labor has been wrong as he could not rely upon previous figures derived from similar orders.

The fundamental reason for this is a loose system of costing and lack of co-ordination between the costing and engineering side of the organization; the clerical can not, or will not, appreciate the engineering outlook.

The following may be cited as a typical instance of the failure of many concerns to deal with realities.

A scheme is set before the executives of a concern, pointing out the weaknesses of the allocation of burden as a percentage of Direct Labor, and that any other method is preferable; in any case oncost is more truly apportionable to time than to value.

Overhead can also be disposed of more satisfactorily, as Direct Labor hours per shop can be estimated with sufficient accuracy for the allocation of oncost, whereas Direct Labor value cannot be so estimated.

This latter statement, can, apparently, be a contentious point, as it is often said that for all practicable purposes they are one and the same thing, Labor costs being readily ascertainable by applying the fixed hourly rates for the several trades to the estimated hours.

Primarily, this result would only be achievable if—

- (1) Type of production unchanging from period to period;
- (2) Quantity of production always constant;
- (3) Direct Labor value unchanging on each and every type of production;

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(4) Labor Hours unchanging on each and every type of production.
In other words, Standard perfect and Output unvarying.

This will never be the case unless a system of Standard Costs is installed, and it certainly would not be the case with a concern having marked variations in under-absorbed oncost at the close of the fiscal period.

The fact of these being under-absorbed oncost implies that there is no foundation for such a statement, and further emphasizes that there should be much closer co-operation between the Engineering and costing personnel.

Provided Direct Labor Hours are known for a certain period with a reasonable degree of accuracy, there will be differences between time and value because of—

(1) Variations in Machine Hours:—

With a scientific system of costing machine hour variations would be adjusted per medium of Idle Time, with the Direct Labor method it involves variations in pay which the application of fixed hourly rates to the several trades will not adjust.

(2) Variations in time of skilled and unskilled labor:—

This would always apply where production was not standard, or where jobs of all types were done to order and always of a varied nature.

(3) Variations in Direct Labor per shop.

No. 2 also applies in this case.

Even though the Direct Labor over the whole works may be constant, yet, where jobs of a varied nature are undertaken, the ratio of Direct Labor per shop will not remain so.

(4) Award, etc., variations:—

Unless a system of monthly analysis is installed, in which variations can be systematically analyzed and adjusted such variations will affect overhead distribution, perhaps adversely.

(5) Workmen employed out of their grades:—

This is a point covered by most Awards and here again it can be seen how Labor values would be affected unless all work was absolutely Standard.

It would be necessary to know the exact times which the men would work out of their grade over the period under review.

Such variations would be evident where Labor itself was Standard, i.e., where an Estimating Engineer could rely upon past results as a guide for current estimates, but practice proves that, in many instances, such standards cannot be relied upon.

The sole cause of this unreliability is lack of Planning Organization.

With sane planning the time and type of labor required to carry out a particular order are readily ascertainable, and jobs can be moved through in rotation from commencement to completion without interruption.

Wise planning does not conflict with the tenets of most Australian Awards which state that Piece and Bonus Work shall not be permitted. The sole reason for such exclusion is fear of victimization, the average worker being a conscientious man who will give a fair return for wages received.

It is a wider knowledge of the "Incidence of Overhead" which is required by Industry, as only in this knowledge will it become generally recognized that overhead has as much right to be charged directly against the production to which it most refers, as has Direct Material and Labor.

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It should not be flung, in some loose haphazard method, upon all production, as though it were some unwanted corpse, better buried and forgotten.

Only by striving for co-ordination between all Departments concerned, can its full importance be appreciated.

Conducting a Costing Department

By A. J. GAIRNS, F.F.I.A., A.A.I.S., A.C.A.A.

Reprinted from *The Australian Accountant*

Since costing work has been recognized as an important and a permanent function of the operations of modern manufacture, the installation of a separate costing department in a business large enough to warrant its establishment and maintenance has followed as a matter of course. Just whether this work is carried out by the accounting personnel already employed or whether other people carry out the routine, is a matter dependent on (a) the size of the concern—as to whether such expansion is warranted; (b) the outlook of the directorate on such modern merchandising trends; (c) the possibility of securing the right man to control the work and the most suitable type of employee.

In the larger factories, it is even the practice to subdivide the costing work into, say, factory control and, perhaps, accounting routine. In these organizations, which are generally composed of a separate factory and head office in different sections of the same city or state, the factory (and even departments of the factory) is "cost controlled" by a separate cost office under the control of a factory accountant. The summarized findings of these sections are forwarded to head office and incorporated in the financial records by the cost accountant. Of course, actually, these various sections are only the costing department of the business and it would be a mistake ever to regard them as anything but the one department or to encourage any competitive or antagonistic spirit between the sections. I have known of one such section "fighting" for the factory while the complete cost sense so essential in the department was found only at head office.

The Departmental Head

In control, of course, is the fully qualified cost accountant. There is little need for me to elaborate on the essential qualifications of this official. A keen cost sense, highly trained accountancy knowledge, ability to control staff, the will to break down the barriers of inefficiency and slackness, and some personality are a few of his attributes, but there are others not so obvious which are no less necessary and are often neglected in selecting applicants for this important post.

The first I would refer to, is the ability to adapt his accounting knowledge and experience to any change which may arise in the conduct of the business under his control—in other words, to visualize each alteration from the point of view of its place in the accountancy system and to make arrangements accordingly. Suppose a new department is established, a

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different method devised for the despatch of goods, a new machine bought for the factory which alters existing routine—the cost accountant must visualize these items in his balance sheet months ahead and make arrangements to cover the necessary routine to place the item in its proper place in the system.

The second trait in the make-up of the ideal cost accountant I wish to stress is a species of moral courage to present, no matter what the result, the true cost figures and, if necessary in order to do so, to overcome opposition from all sources whether it be production officials, sales directors or even management itself. A great deal of tact and patience is of course essential to success, but, even if recourse is made to a measure of bluntness on occasions, the means to an end are justified if error and inefficiency are uncovered.

The Costing Staff

This matter, of course, must be discussed in the light of the size of the organization and the other factors previously mentioned. The "staff" may be a single assistant to the cost man or 100 clerks, so that this divergence must be borne in mind and the individual factors envisaged when reading the following summary. The amount of detail work which normally should be carried out by the cost accountant is discussed later in this article, but, in a department of almost any reasonable size, it is definitely advocated that the head of the department have a "right-hand man"—an assistant capable of any task short of executive action. This might cover ledger posting, actual control of the staff, technical liaison work or such occupation of an important nature likely to be an onerous burden to the man in charge. As far as the rest of the staff is concerned, I have found from experience that it is much better to allocate a specific task to each member of the staff rather than to expect each member to operate in all or any section. Bearing this in mind, the selection of staff members must be made according to the most suitable material offering. A judicious mixture of seniors and juniors is advisable, and both males and females prove good workers in the various sections. To conduct costing work efficiently, it is necessary to follow very closely the mode of manufacture in the factory, and for this work, viz., the compiling of process costs and standards, I always endeavor to secure a technically-minded male senior. Girls are ideal for reports and stock control work, although, again, I always engage a male for raw material control as I expect a great deal of physical checking work which might be disagreeable to a lady clerk. In these days of wartime man-power problems, however, little choice in these matters is generally available. One person essential to the department, however, is a calculator operator.

Subdivisions of the Work

Generally speaking, the complete costing department can be broken up into the following sub-sections:

- (a) Supervision and control.
- (b) Straight-out bookkeeping routine.
- (c) Raw materials stock control.
- (d) Finished goods stock control.

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- (e) Assessment of factory or departmental production.
- (f) Compiling of standard and process costs.
- (g) Calculation of "do and charge" work, job costs, etc., in departments where applicable.

This classification may be supplemented according to the detail required, but it will be generally found to include all functions. For instance, the big task attendant to requisitions of raw materials to departments, would be carried out by the raw material clerk as part of his job, and the equally important work of wage dissection would come under bookkeeping routine. The method adopted to secure the factory costing figures and the data necessary to secure periodical profit statements is also important. If a stock-taking is possible of finished goods, an assistant may be necessary for its computation, otherwise the standard cost price of sales is usually adopted as the basis for the trading account debit. This work alone may be sectionalized or included in the bookkeeping routine.

Routine Work

The vast amount of detail work necessary in a cost department involves a high degree of organization and control. The various "bits and pieces" which go to make the complete cost picture must all be ready in order that the failure of one section to reach conclusion does not hold up the whole routine. A normal step-by-step costing routine may involve a procedure along the following lines: Commencing with a factory stock-taking, report on differences between physical and theoretical figures in raw material stock, complete posting of requisitions, compile "batch" or "mix" data (most factories commence operations by alloying or mixing working stock batches), assess factory and departmental production, dissect wages, post ledger or ledgers, compile cost price of sales, trial balance of all ledgers, and complete final bookkeeping to the balance sheet stage. If one cog of this chain is running late, the whole system breaks down and the necessity for avoiding this calamity means constant supervision and a high degree of concentration and effort at all times by the costing staff. Not only must the work be done speedily and to schedule, but, most important of all, it must be positively accurate. No matter how serious a delay is caused, figures which are doubtful as far as accuracy is concerned must be checked and, if necessary, corrected. Cost figures which are inaccurate are worse than useless—they are, in fact, highly dangerous to the welfare of the business. So anxious are many cost accountants to ensure correctness, that they themselves take a much greater part in the routine checking work than, for instance, their colleagues, the financial accountants. A word has been said previously for the cost accountant's assistant and, while close attention to the departmental routine is not wholly undesirable, it must not be forgotten that this detail work must crowd out the broader matters of principle involved in keeping abreast of the pace of modern manufacturing. I have always found that a good cost accountant can fully occupy his time in "interpreting" the figures, in conferences to effect any changes deemed necessary thereby and in overhauling present methods to cover the march of progress in the industry concerned.

Stock-taking and Stock Control

No management is content to-day to accept the old methods of historical

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accountancy. Nothing less than a well-prepared budget proved by monthly or four-weekly profit and trading figures should satisfy the up-to-date directorate. Standard costs should be proved against the actual elements of cost by calculating production at standard and transferring differences to the various accounts. In order properly to assess these values, a factory stock-taking each "period" is necessary and should be carried out to the entire satisfaction of the cost accountant and his staff. These people should enter wholeheartedly into this procedure and on stock-taking days, the whole of the costing staff should check as much of the stock (work in progress) as is humanly possible. Just what this periodical stock-taking should embrace will again depend on the individual system in operation. I am usually insistent on the raw material stock being taken also on these periodical occasions, as the whole factory cost system is dependent on material usage and proof being available of the correctness of requisitions. No control system is sufficiently accurate or reliable to enable one to dispense with physical counting and, once again, the axiom of accuracy above all things is stressed. If gross profits are calculated by using the standard cost price of sales and deducting from net sales, finished stock will be estimated only by adding factory production and deducting the cost price of sales figure. In this case, I would not be prepared to accept the resultant figures with confidence unless an efficient stock control of finished goods store is in operation. This should be conducted by the costing department. The actual system adopted is not the immediate concern of this article, but would depend on the store facilities and the degree of check required.

Cost Reports

Quite apart from the figures relating to financial results prepared by the cost accountant and considered by the directors, the costing department must make many reports on the activities under its control. A few typical examples are as follows:

- (a) Raw material stock discrepancies.
- (b) Finished stock discrepancies.
- (c) "Black" list (non-payable lines) for sales department.
- (d) Department variance statements.
- (e) Report on actual times against standards.
- (f) Job report—actual costs against standard.
- (g) Weight check report.

And as many others as required.

These reports should be carefully prepared either by, or under, instructions from the costing department head himself. A very good suggestion is to address each report and deliver a copy to the managing director (or the proprietor) even although the document itself goes to either the storeman concerned, the factory production manager, sales manager or the chief chemist. These officials, in turn, direct their replies to the same source, from whence the cost accountant receives his instructions either verbally in conference or in writing from his superior. Each report thus has executive sanction and passes through the managerial office.

The Purpose of the Department

Finally, a word is necessary about the high place this department must take in the general organization. It is hardly necessary to reiterate that the

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cost accountant is an aid to management. He must never supersede management, but must always be subservient to and controlled by management. The department under his control thus must follow this principle in all its work. Those responsible in the department must be ready and capable to provide up-to-date information regarding costs and processes. Fullest information and co-operation must be provided to the quotation officer. In many instances, the costing department must be the liaison between market values as presented by the sales department and actual costs as provided by the factory. Its duty is at all times plain. It must present only the true cost. If this is not satisfactory to the sales effort then the factory must be asked for an amendment and a new cost worked out accordingly.

The department must preserve a high reputation for keenness and unbiased judgment. In its hands lie the future and welfare of modern secondary industry. Management, in the years to come, will call more and more on its services and advice. Let the cost accountant and his staff remember this and prepare themselves to be worthy of their place in business.

Factory Organization and Production Methods

By C. E. APPLEYARD, M.J.Inst.E., A.M.I.LOCO,E.

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In preparing this paper to meet the needs of Registered Students more particularly, it was thought advisable to treat the subject on broad general lines and make some attempt to supplement the information available in the suggested text books.

With this object in view, an attempt has been made (1) to outline the general business structure of which the factory and its organization is a part, (2) to consider the generally recognized systems of organizations for factories, (3) to review some of the more practical points of buildings, machinery, materials and man power which should receive consideration, and (4) to outline some of the problems of production.

Factory Organization is part of a larger business structure, and it is proposed to outline briefly some points regarding the major organization first. There are three fundamental divisions to the business structure, covering Finance, Production and Distribution:—

Finance is concerned with the provision of the necessary capital and the recording and control of all transactions relating to money;

Production covers all the activities of manufacture;

Distribution embraces those activities connected with the selling and disposal of the manufactured article.

Sound finance demands that the aim of the operations be to produce a profit, which is necessary to ensure a continuity of operations.

Further, the product must be saleable, i.e., either:—

(a) in demand by the community, or

(b) of such a nature that a demand can be created.

It must be available for distribution in sufficient quantity, at the time it

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is wanted and at a price which the community, or some special section of it, is both willing and able to pay.

Consequently, it can be said that Production Operations should be based on Sales Volume and Market Capacity and must further fit into the other sections of the organized business.

Obviously, the Projected Sales Volume has a direct bearing on the capacity of the factory and on the financial outlay for plant and machinery.

It is frequently found that, owing to too little consideration or inaccurate information, the productive capacity bears no relation to Sales needs, and difficulties arise which should have been foreseen and provided for.

It may be said that, as a principle of organization, the productive capacity should be based on a carefully assessed sales volume with a margin for unforeseen events.

In building up the general structure, three further points should be considered:—

- (1) the various parts of which the business is comprised;
- (2) the relation of the several parts to one another;
- (3) their relative importance.

It has already been indicated that Finance, Production and Distribution are the three main divisions, but there are three sub-divisions of which note should be made, namely, Administration, Management, and Operation:—

Administration is the process of determining policy, co-ordinating finance, production and distribution, determining the general form and structure of the business and exercising final control;

Management is the actual work of control, the employment and putting to work of all available human and mechanical means to achieve the full aims of the business;

Operation is the manual and mechanical work involved in manufacturing and distributing the product.

It will be obvious that each of the last-named sub-divisions has its proper place in the major divisions and the extent of each section must depend on the nature and size of the undertaking.

Finally, all the efforts of all the various members of the components of any business should be directed towards the successful production of a saleable article at the correct price by the shortest route possible compatible with a predetermined standard of quality and workmanship.

Turning now to a detailed consideration of Factory Organization in general, the matter can usefully be grouped under four headings:—

- (a) What to manufacture;
- (b) Where to manufacture;
- (c) What buildings, plant and machinery are necessary;
- (d) The degree of organization required.

Strictly speaking, these are major concerns of the Administration, but it is useful to review them so that their effect on the organization can be assessed.

What to Manufacture should be defined in as precise terms as possible before anything further is considered. Taking an Iron Foundry manufacturing a variety of iron castings, the aim should not be merely "Iron Castings," but "Iron Castings varying in weight from one pound to one hundredweight, with an annual output of 500 tons."

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This precise statement immediately gives a firm foundation on which to build, as it enables the equipment, buildings, materials, etc., to be assessed within specified limits.

Where to Manufacture must be reviewed from geographical as well as physical standpoints. Certain industries require special climatic conditions, water supply and transport facilities. Generally, the major considerations in the location of a factory site are:—

- (a) Accessibility of material supplies;
- (b) Nearness to supplies of suitable labor;
- (c) Nearness to potential markets;
- (d) Physical characteristics and nature of ground and subsoil;
- (e) Transport facilities (rail, road and water for both goods and passengers);
- (f) Expense factors, such as rent, rates, taxes, drainage, road and land costs;
- (g) Availability of utility supplies (gas, electricity, water and sewerage);
- (h) Facilities for expansion.

The above order does not necessarily indicate the order of importance, as special industries may require more stress on one aspect than another. Nor is it proposed to discuss these considerations at length. It may, however, be of interest to record the results of a survey carried out some years ago by a well-known periodical "BUSINESS." A large number of firms were approached and the replies to the questionnaire carefully analyzed. The vital factor affecting most decisions was:—

- (1) Nearness to markets;
- (2) Renting of suitable buildings;
- (3) Cheap and accessible transport.

It was, however, noted that the item which received most consideration was—cheap and accessible transport.

In this connection, mention may be made of the Government sponsored Planned Industrial Estates which are now in being in various parts of the country. These estates provide factory buildings which are rentable, in a district specially chosen and provided with road, rail and utility services, and whilst being manufacturing areas, a definite attempt is made to retain reasonable amenities of light, space and planned orderliness.

What Buildings, Plant and Machinery are Required.—The consideration of these points calls for master planning with respect to materials, operations, methods of manufacture, requirements of machining, fitting, erecting, testing, packing and despatch along general lines.

Every process should receive individual consideration, in as great detail as time will permit, so that from the detailed analysis, a comprehensive summary can be raised which will indicate the following requirements:—

- (a) The approximate floor space requirements;
- (b) The desirable type of building;
- (c) The necessary ancillary services (gas, water and power);
- (d) Necessary types and quantities of machinery;
- (e) The power requirements of the above;
- (f) Some indication of the personnel requirements.

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All these points raise production problems, and some of these aspects will be dealt with in a little more detail at a later stage.

The degree of organization required depends upon the nature of the product and the size of the undertaking. A small concern manufacturing a single article should not require the same degree of organization as a large factory covering a variety of products.

It is therefore proposed to deal next with the recognized types of organization, indicating as far as possible their differences, advantages and drawbacks.

TYPES OF ORGANIZATION

1. Departmental Organization

This system is sometimes referred to as the military or traditional system, as it is the earliest type of organization met with.

Under this system, the work of the business is divided into processes, products and areas and each of these sections then becomes a department. The head of the department is held completely responsible for all the activities of the department, including the purchase of materials, the design of products, the engagement of labor, the keeping of records, the maintenance of machinery and the making of a departmental profit.

The distinguishing feature of this type of organization is the self sufficiency of each main unit in the business. There is a minimum of cross relationships, responsibility is clear and the system has a satisfying sense of simplicity and completeness. This latter simplicity constitutes the main weakness in a modern organization, as conditions rarely permit such simplicity except in a small or one-man concern. The organization also depends for its success on the ability of one man and may therefore suffer from lack of continuity.

In its detailed workings, it has many sound features, such as direct responsibility and authority, but there can be much overlapping between departments and too much reliance has to be placed on the initiative and driving force of one man.

2. Staff and Line Organization

Staff and Line Organization is a development of the departmental, where "Line" indicates executive control and "Staff" is advisory and supplementary. "Line" is responsible for all manufacturing processes and the control, whilst "Staff" becomes responsible for providing information, statistics, records, data, and advice, without authority to put measures into practice; that authority alone belongs to "Line." Actually, it is the beginning of specialization, as the complexity of modern industry is such that those directing actual production are physically unable to keep in proper touch with all the changes and investigations, and these duties are allocated to experts, who can then give advice based on unbiased and undivided attention to particular problems.

This distinction between "thinkers" and "doers" marks an important step in the division of labor which is one of the great characteristics of modern industrial life. Specialization is necessary in almost all walks of life to-day, though it is not without its attendant dangers of narrowed outlook and restriction on latent ability.

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3. Functional Organization

The principle of this type is the division, not into processes, products or areas, but into "techniques" or "functions." It is specialization in a highly organized form and is the direct antithesis of departmental organization, which carries a multiplicity of functions within a process or product.

While "Staff and Line" draws a clear distinction between executive and advisory work, functional organization makes the head of a function entirely responsible for that function through the business, having authority for execution vested in him. The organization is more complex and co-ordination requires special attention but it conduces to greater efficiency, and expansion is easily catered for, being an extension of existing duties rather than the addition of new ones.

Further, it allows an individual to concentrate on one particular activity and develop it as a strong line, though it may at the same time be the cause of other latent talents and abilities remaining hidden. This division into functions has arisen because of the complexity and increasing technicality of modern production.

The functional principle of organization probably affords the most effective means of conducting large scale industries to-day with the greatest degree of efficiency.

4. Committee Organization

Committee Organization is a development from functional organization, where the heads of important sections or functions are brought together under a Chairman and Secretary. It brings together the best brains of an undertaking for frank discussions on problems as they arise, and each individual has executive authority within his own function.

The Committee is, however, rather legislative than executive and it requires a strong and tactful Chairman to ensure that decisions are carried through into action. Its main objective is to maintain close co-operation and promote teamwork, but unless the leadership is both energetic and diplomatic, there is a danger of debate rather than action, of weak decisions due to lack of authority.

Whilst an attempt has been made to describe the principles of certain recognized types of organization, it must be pointed out that each business must adapt its organization to suit its particular problems. A combination of functional and departmental organization may be the most suitable, and the object should be to ensure smooth working of all parts of the business.

There should be as clear a line of authority and responsibility as possible, and it is suggested that charts should be prepared of the organization, indicating the authority, responsibility and degree of co-ordination required between the various sections, so that all are working to produce a steady forward movement.

Factory Buildings and Equipment

Factory buildings can be divided into two main types, namely single-storey and multi-storey buildings.

Single-storey buildings are usual wherever space permits, as they have advantages of lighting, heating, fire protection and supervision as well as generally lower first costs.

Multi-storey buildings are found where the site is restricted in area and where light processes do not necessitate such heavy foundations. The

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possibility of damage by fire and water is increased, and supervision is not always so simple. Lighting from natural sources may be difficult.

In modern new buildings, reinforced concrete is usually used for the latter, whilst a steel frame with corrugated sheeting, either steel or asbestos, is used for the single-storey buildings. The single-storey building especially lends itself to full use of "north light" when site permits.

Heating and Ventilation are usefully taken together, as a satisfactory heating system depends a good deal on adequate ventilation. Comfortable working conditions depend not only on air temperature but also on wall and ceiling temperatures, humidity, cleanliness and movement of the air. Four groups of heating are normally applicable to factories:—

- (a) Steam heating, using pipes and radiators;
- (b) Hot water heating, using similar means;
- (c) Hot air heating, where air drawn from the outside atmosphere is heated (or cooled) by passing over coils of tubes and subsequently distributed by ducts and steel or masonry trunking arrangements;
- (d) Local heating units, using gas, electricity or hot air for supplementing any of the above systems and dealing with cold and draughty places.

Both steam and hot water systems have a tendency to dry the atmosphere, and means should be introduced to replenish the moisture content.

Ventilation by natural means, as roof and wall ventilators, windows and doors, frequently requires supplementing by provision of circulating and exhaust fans.

Lighting

The importance of adequate lighting cannot be too highly stressed, as probably 80 per cent. of all manufacturing processes require accurate sight for their control. Good lighting should have the following characteristics:—

- (a) Adequate light for the particular conditions;
- (b) Uniform illumination;
- (c) The avoidance of glare;
- (d) The avoidance of deep shadow;
- (e) Adequate maintenance and cleaning;
- (f) The use of good quality equipment.

As natural light is free, full use should be made of it by adequate window spaces in both walls and roof where possible. At the same time, care must be exercised that large areas of glass do not give rise to unappreciated heating troubles, as changes of wind or external temperature may adversely affect internal temperature. Automatic heating controls can be utilized to overcome this drawback. North lights (i.e., lights facing north), afford more uniform illumination and tend to eliminate glare. Artificial lighting should supplement natural lighting and completely replace it when night falls.

The rather harsh white light of the electric filament type of bulb is being replaced in some factories by the use of mercury or sodium discharge type lamps. These lamps, which give a bluish or yellowish light, are claimed to be more economical and more restful, but psychologically are somewhat unsatisfactory, since the features appear to assume a ghastly pallor.

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It should be remarked that it is equally important to keep all glass and lighting fittings clean and bright so as to provide adequate lighting in the first instance. A regular maintenance schedule should be adopted.

Fire Prevention

Every factory building should be adequately supplied in this respect, by provision of water hydrants, sprinkler systems where applicable and hand appliances such as chemical extinguishers. Considerable savings can be made on insurance premiums where adequate fire prevention steps are provided.

In presenting the above remarks on buildings and their equipment, it is assumed that expert advice would be taken before commitments of a financial or structural nature are undertaken. It must be pointed out that there are numerous regulations of local authorities and government bodies which must be carried out, but the Cost Accountant should endeavor to reduce his maintenance charges against buildings wherever possible and it is usually sounder policy to provide adequate and good class buildings at the start, than to incur heavy expenses in maintaining inferior buildings. With this object in view, the young Accountant would do well to acquire some general knowledge of these subjects, so that he can assess the value of a higher capital outlay against a heavy recurring maintenance and repair bill.

Power and the Driving of Machinery

Obviously some form of power must be provided to drive the factory machinery and many different forms are available.

The chief natural sources of power are water power and the stored energy of combustible materials (coal, wood and oil). Where physical conditions permit, water can often form a cheap source of power, by utilizing the force of gravity. The stored energy of combustible materials requires some form of heat engine, either steam or internal combustion, to convert the energy into a usable form.

It is not proposed to discuss these in any detail as time does not permit. However, in almost all cases rotary power is necessary, and either water power or some form of heat engine can meet this need. Owing to the ease with which it can be transmitted, electricity probably forms the greatest source of driving power to-day. Some form of rotary motion is used to generate the current in the first place by means of a dynamo; the current is then conveyed through cables and wires to the point of application, where it is reconverted into rotary motion through the medium of an electric motor.

Nevertheless there are other forms of power transmission which may afford advantages in special circumstances.

Direct Transmission is indicated when the prime mover is coupled directly to the machinery it drives.

Mechanical Transmission employs the medium of shafting, belts, rope, chain or gearing between the prime mover and the machine. The medium used necessarily absorbs a certain amount of the power generated.

Hydraulic Transmission utilizes either water or oil as a medium, usually to supply a heavy pressure at a machine for a comparatively light load initially.

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Pneumatic or Compressed Air is often used as a flexible means of power transmission where electricity is not easily available, especially for outside work on roads and so forth, and for small hand tools in the factory.

An important point with regard to both buildings and machinery which should have attention is that of maintenance.

Machines require regular attention for cleaning, oiling and adjustments, and buildings need examination from time to time to ensure their satisfactory functioning.

This work should be allocated to a special group within the factory, so that the work can be carried out regularly on a proper schedule and reports made of the findings from time to time.

Proper maintenance can frequently prevent breakdowns by giving warning of abnormal conditions, and preparations can be made beforehand to effect repairs or overhauls within the Works production schedule.

Maintenance is a skilled job and requires not only good personnel but adequate organization to assist that personnel. The whole aim of the maintenance section should be to maintain productive activities at a constant high level.

It is now proposed to consider some points which will have an effect on the Production side of the undertaking and it is important to know in what quantity and degree of similarity the products are to be manufactured. Large quantities of identical products are simpler to deal with, as they ensure a continuity which is not possible if smaller quantities are to be dealt with.

There are three groups—namely, unit, batch and mass production.

Unit Production typifies that class of work where each product is unlike the next, except in general construction or type.

Batch Production is indicated when small quantities of identical products will be produced, permitting a greater degree of continuity.

Mass Production covers that field of manufacture where exceptionally large quantities are to be made, all identical.

Actually, mass production is easier to plan and maintain in steady operation, as one operation can be separated more readily and allocated to one individual. Batch and unit production require more general availability of plant and offer less opportunity for straightforward operations.

Special machinery can be installed for mass production work, since a small time saving per piece becomes considerable in the aggregate and the cost of the special machine is recovered in time saving.

Layout, Grouping and Driving of Plant or Machinery

It is important that the layout and grouping of plant be carefully considered so that materials may proceed steadily in a forward direction as far as possible.

In order to facilitate supervision and make driving arrangements more compact, similar machines are often grouped together in a bay or area. At the same time, production requirements and unnecessary movement of material may necessitate the installation of occasional machines apart from the normal grouping. Detailed planning depends on the needs of the particular factory and a good plan when considering machine grouping is to prepare a plan on the floor area allocated, to scale, and prepare loose templates to the same scale to represent machines. After making provision for gang-

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ways, the arranging of the machines to suit grouping or driving arrangements can be easily altered and moved about until the most satisfactory plan is arrived at. A working plan is then easy to prepare.

In addition to access gangways, provision should be made for storage space for material in progress, so that machine loading is not hampered nor are gangways blocked by work awaiting attention. Where electric power is used, it is possible to provide individual drives to any machine, large or small, though it is a more economical method to provide a larger prime mover or motor to drive several machines, which motor can be run more regularly near its peak load.

Equally important to the correct grouping of machinery is the adequate provision of stores and means for handling materials mechanically.

The arrangement of storage places should again follow the plan of work progression rather than provide for one central store for all materials. The most satisfactory arrangement usually is to provide a main store, reasonably accessible from the Works roads and sidings and centrally situated, with sub-stores in various parts for materials used by particular departments only.

Provision must also be made for tool and drawing stores, raw material, part finished and completed sub-assemblies awaiting the main product.

The principle should be to bring the material to the worker rather than that the worker has to travel considerable distances. Mechanical appliances for moving material from place to place are almost limitless in both capacity and scope. Not only should lifting appliances be provided but use can be made of roller conveyors, chutes, elevators and runways in addition to movable wheeled conveyances.

Planning and Progressing

The necessity of careful planning of operations has been emphasised throughout. Planning as a section is concerned with the preparation of all manufacturing operations, including supply of material, machines, manpower and any necessary equipment. It is the job of the planning department to point the way and indicate, as clearly as possible before operations start, the exact manufacturing procedure which is intended.

Progressing, on the other hand, is concerned with the carrying through of that plan in the manner indicated and to the times laid down. The two sections must work closely together and it is the duty of "progress" to advise any changes found necessary and the proposed steps, so that the master plan can be adjusted accordingly.

Planning must be done with all the anticipated factory load taken into consideration, and, like a jigsaw puzzle, all the pieces should combine into a complete picture. It may be found necessary during manufacture to make a detour to avoid stoppage, but both progress and planning must co-operate to remove the stoppage and permit work to flow again along a charted route as soon as possible.

Standards of Work

It will be recalled that in the early stages of the formation of the business, a precise definition was called for of the products of manufacture. For efficient and cheap production, the more a particular product can be standardised, the easier it becomes to arrange manufacturing programmes. Standardisation means the establishment of regular customs and practices,

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from which there should be no deviation. So important to industry is standardisation that the British Standards Institution has issued standard specifications for many hundreds of materials and methods of manufacture, from screw threads to paint colours, from precise analyses of steel requirements to sizes of tins and cans for food products. These standards are drawn up with a view to facilitating manufacture by prescribing limits suitable to each particular item or process. For example, screw threads have very fine limits prescribed to permit interchangeability. Steel and other material specifications allow variations in percentages, so long as certain test results are obtained.

In the same way, standards should be set up within a factory indicating amongst other things:—

- (a) materials which can be called for;
- (b) methods of manufacture;
- (c) limits of accuracy for all or certain processes;
- (d) the quality of particular materials as to texture and finish;
- (e) inspection standards.

Having prescribed and determined certain standards, a check must be instituted within the Works procedure to ensure that these instructions are being carried out. This work is allocated to an Inspection Department, which provides an organisation and qualified personnel to ensure that orders are being obeyed.

It must be pointed out, however, that authority should be invested in the heads of the Inspection Department, not merely to check and approve or scrap, but also to indicate where processes may be varied to cheapen the product without detriment or to suggest alternative materials. It is important that inspection be constructive and not destructive.

All incoming materials should be approved as well as intermediate processes and completed products. Intermediate inspection is necessary to ensure that further work is not performed on spoilt work.

Man Power

Probably the most difficult problem for any industrial undertaking is to provide and maintain a suitable supply of workers.

Human beings, unlike materials, certainly react to specified conditions and treatment, but the resulting reactions are not so certain as in the case of materials. The degree of interest that any worker displays in the allotted task will be reflected in the results as well as in the performance. Good work is never performed by indifferent and disinterested workers, and management's problem is how to encourage and stimulate interest.

Broadly speaking, there are three groups of workers, though there is no sharp line of demarcation between groups, and the grouping is used only as a general indication of the work performed.

Operative or Manual Groups are those who do the actual manual operations and apply manual skill to the shaping and changing of material form. Their chief task is to carry out specified instructions by means of a drawing or written or verbal instructions. The latter should be used to supplement the former, as the more precise the instructions, the easier the task of the operator.

Clerical and Technical Groups prepare the instructions and suggest the route for the operator under supervision. Drawings, plans, instructions,

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schedules of materials, time and wages records, stores requisitions and so on must all be prepared in anticipation of production requirements so as to be ready for immediate use when called for.

Whilst the operations of Clerical and Technical staffs are necessary to provide information to both Operative and Supervisory Groups, care should be constantly exercised to ensure that only useful work is undertaken and that paper work is reduced to the minimum consistent with efficiency.

Additionally, every step should be reviewed from time to time, to ensure that a definite and useful purpose is being served by the information supplied.

Supervisory Grades have to interpret the wishes of the management to their subordinates and exercise control and guidance to ensure that production activities can proceed steadily to their goal of completion.

The planning of work, the choosing of workers, and a share in the organising work of a factory are some of the activities of the supervisory grades as well as direct supervision. Training and examination of workers is equally important.

The Supervisory Staff should aim at co-ordination of tasks rather than personal execution of particular jobs. Their job is not so much to undertake tasks themselves as to ensure that adequate measures are taken to provide a clear and charted path for operations, so that the prescribed plan works successfully and ensures a steady flow of work through the whole factory by the complete co-ordination of the efforts of all.

Grading, Training and Promotion of Workers

With a view to ensure continuity of operations, it is desirable that the working staff be stable and not subject to any avoidable fluctuation due to unnecessary movement or labour turnover.

Workers may be absent from illness and other unavoidable causes but steps should be taken to prevent unnecessary movement and absenteeism by providing (a) satisfactory working conditions, (b) reasonable remuneration, (c) opportunity for advancement.

Working conditions have already been discussed from a physical standpoint and other conditions can be made the subject of a standard instruction applicable to all on the question of holidays, overtime, sick leave and so forth, accepted as a condition of employment.

Remuneration should vary according to the nature of the work and the degree of responsibility. In certain industries, basic wages are fixed by either Trade Board or Trade Union regulations. In other cases, wages are based on customary rates within the particular industry or area.

Additionally, it is usual to offer some inducement in the form of a bonus or extra money for increased output, since a saving in manufacturing time means a cost saving to the factory.

Operative workers are usually paid on an hourly basis whilst clerical, technical and supervisory workers are remunerated on a weekly or monthly basis, and afforded certain additional "staff" privileges.

Nevertheless, the true basis for remuneration should be ability, and the aim of the management should be to encourage the acquisition of knowledge and skill and also afford opportunities to lower grades of training, so that they may be up graded where a desire to do so is indicated.

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Frequently, the apprentice scheme in a works is based on some suitable advancing scale of efficiency, but on attaining the age of 21 years in many cases workers are offered little or no inducement to increase their value to the firm, and the ambitious employee is often obliged to leave the firm and go elsewhere to secure wider experience and higher remuneration. Whilst this may be desirable from a personal point of view in affording an individual the opportunity of trying other types of work, it has a detrimental effect on industry in general, and often workers return to their original firm but in a higher grade. These services could probably have been retained if a suitable scheme of advancement in the firm had been made known, and the cost of training new employees to take the place of those leaving would have been avoided.

The loss to industry through labor turnover annually is very great and many schemes of bonus and pension benefits are being adopted in many parts. Nevertheless the problem appears to go deeper than mere financial return and the communal interest of all employees should be more generally stimulated.

Promotion should be possible to the highest positions in the organisation provided that ability and a true desire to give better service are the criteria for such promotions.

Basic wages rates operating over large numbers of workers have the effect of bringing the level of work of the best workers down to the level of the least efficient operatives, unless some additional incentive for skill and ability is forthcoming.

It must also be noted that social amenities and housing facilities can be utilised to stabilize a working force and such schemes to-day are looked upon, not as philanthropy, but as very sound business organisation.

* * *

Having covered some of the many points within the compass of Factory Organisation and Production Methods, it is realised that much material and many items of interest have perforce been omitted. It is thought desirable, however, to summarise briefly the main purposes and principles on which a Factory Organisation should be built.

Factory Organisation deals more particularly with the problems of applying the forces of labour and machinery to materials for the efficient production of some article required by the community. It is necessary that careful planning right from the start be persistently followed up. A sound and efficient manned organisation should enable three results to be attained, namely:—

- (1) A service to the community or some part of it;
- (2) Contentment to the worker;
- (3) The efficient use of materials, money, men and method to the production of a sound article.

A successful organisation should provide for the following requirements (taken from Porosky's *Factory Administration*):—

- (1) A definite line of authority, which involves co-ordination of effort;
- (2) Responsibility, which means control;
- (3) Division of Labour in order to avoid confusion and secure the benefits of expert service;

COST AND MANAGEMENT

- (4) A System which assigns authority and responsibility;
- (5) Discipline which maintains the organisation;
- (6) Successful planning;
- (7) The keep of adequate records and statistics;
- (8) The promotion of teamwork.

Furthermore, the organisation must be adjusted to suit the conditions of the particular factory requirements, to ensure continuity of production, and standardisation should be utilised as fully as possible.

(A number of diagrams amplifying the lecturer's remarks were produced at the meeting but these have had to be omitted.—Ed.)

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Student Activities

The interest displayed since the start of the present season in our Student activities prompts the thought that perhaps an explanation is necessary. An explanation not to student members but to senior members who, in many cases undoubtedly have on their staffs, young men eligible for student membership and who should take advantage of the benefits such membership gives.

First, it should be explained that as a Society we do not sponsor a course. We do recognize certain correspondence courses which are a combination of Accounting, Cost Accounting and Business Organization and Management and we do recognize the McGill Extension Course in Cost Accounting and a similar course recently sponsored by McMaster University.

Obviously we cannot, at the very small student fee charged, give a complete course nor do we attempt to do so. What we are doing in the various Student Sections is to attempt to implement the present studies of our Student members and this is being done in all sections by a systematic study of "Cost Accounting" a well-known and highly regarded text book by W. B. Lawrence and which is part of the McGill University Extension Course and is used as a basis for our Cost Accounting examinations.

Lectures from the text book will be given by designated senior members with a regular discussion on the lecture at the close.

By this means we hope to give some planned direction to students and to make sure that they are taught the basic principles of Cost Accounting.

This plan we hope to enlarge in the future and we believe that it will greatly assist students to pass our Cost Accounting exams. More than that, however, it will first of all teach the student the fundamentals of Cost Accounting.

This is absolutely necessary apart altogether from a question of examinations because so many men enter industry and learn only a system.

We commend this scheme to the attention of senior members, not altogether for themselves, but in order that they may interest students under their control in their own particular industry, we urge them to enrol their students as Student members of our Society.

This student work is growing rapidly and is becoming one of our main endeavors as it should be, but it can only succeed if the scheme has the wholehearted approval of our senior members and, in addition, their support.

More and more student members are necessary in order to ensure the success of this movement. These Student Sections conduct their own meetings under their own officers and in addition, of course, the members are privileged to attend senior meetings and receive all the benefits of senior membership.

If you have on your staff, or if you know of any student who is not a member of your local Student Section, why not communicate with the Secretary, who will immediately take steps to see that such a person becomes a member.

COST STUDIES PUBLISHED BY THE SOCIETY

(Copies available at 50 cents each).

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